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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/677,632

10/02/2003

Haishan Zeng

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EXAMINER

KISH, JAMES M

ART UNIT

PAPER NUMBER

3737

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

02/20/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/677,632

Applicant(s)

ZENG ET AL.

Examiner

James Kish

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-91 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-91 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>3/24/04, 7/25/05</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Objections

1. Claim 9 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

2. Claims 60 and 61 are objected to because of the following informalities:

Both claims 60 and 61 discuss "the EEM." However, the parent claim, claim 44, does not disclose the EEM. Examiner believes these claims should be dependent from claim 59.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 70 is rejected under 35 U.S.C. 102(b) as being anticipated by Lewis et al. (US Patent No. 5,528,368). Lewis discloses a spectroscopic imaging device for imaging with a spectral resolution of a few nanometers and a spatial resolution of about a micron, collected rapidly using an AOTF. The AOTF in the illustrated embodiment has a resolution of approximately 2.5 nm (column 8, lines 14-28) and can be varied based on the specific parameters of the of the AOTF, as known by one of ordinary skill in the art and described at column 1, lines 26-45. One disclosed embodiment uses

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parameters that allow images to be recorded over the wavelength range 400-800 nm at 2 nm increments using a 15 millisecond exposure at each wavelength. The total measurement time is 3 seconds (column 12, lines 27-44) and covers 400 nm, therefore, using these parameters it could scan 800 nm in 6 seconds.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-15, 18, 21-24, 29-37, 40, 43-44, 46-53, 56, 59-64, 68-69 and 86-91 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zeng et al. (US Patent No. 6,069,689) in view of Vo-Dinh (US Patent No. 5,599,717). Zeng discloses an apparatus for diagnosis of skin disease via spectral analysis (see Figures 17-19). The device is able to detect and analyze fluorescence both within and beyond the visible spectrum to distinguish between a variety of skin diseases. The excitation light source typically being an IR or NIR light source (column 8, lines 20-21) with a wavelength of 785 nm (column 8, line 41). The system comprises a personal computer and the spectral analysis means preferably comprises a computer interface (column 2, lines 54-62). There is a light source and a bifurcated light guide which contains filters in both the illumination path and the fluorescence path used to eliminate Raman signals generated by the illumination fiber and remove elastically scattered illumination light in the return

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path (column 3, lines 1-17; column 8, lines 50-59; column 6, lines 24-30). Zeng determines spectral measurement in three dimensions via a fluorescence excitation-emission matrix (EEM), as well as a two dimensional plot of the spectrum (column 5, lines 51-64). Also see column 13, line 43 through column 14, line 18 for further discussion of the EEM. At column 8, lines 52-59, Zeng describes using filters to control and remove unwanted wavelengths from both the illumination light and fluoresced light. However, Zeng does not go into great detail other than stating this filter as being a band pass filter. Vo-Dinh teaches an advanced synchronous luminescence system. The device uses a light source and acousto-optic tunable filters to illuminate and detect fluorescence from cancerous sites. The AOTF are used in this case to allow a specific wavelength of light to illuminate the detected area and also to allow only a specific wavelength reach the detector (column 5, line 41 through column 6, line 24). In this case, the detector could be a CCD, PDA or a photomultiplier (column 4, lines 31-34). The signal from the photomultiplier is preferably amplified with a fast preamplifier (column 7, lines 21-22). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use an AOTF, as taught by Vo-Dinh, in the system of Zeng in because Zeng discloses that autofluorescence spectra collected at many different excitation wavelengths can be used to build a 3-D spectral diagram (column 13, lines 43-45). Vo-Dinh teaches that an AOTF achieves wavelength selectivity by varying the frequency of the electrical drive signal. Therefore, a tunable optical source is readily created from a broad-band source (column 6, lines 6-14).

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5. With respect to claims 6-8, 10, 29-30 and 50-51, Examiner cites in re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960), where the court held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced. See MPEP 2144.04.

6. With respect to claims 45 and 66-67, Zeng discloses a computer-implemented program that makes use of the peak position(s) of Raman spectra, relative intensities of different peaks to identify specific molecules and their relative concentrations relative to different tissue states in order to identify and distinguish one disease from another (column 8, lines 34-40). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include the peaks at which melanin appear in order to increase the utility of the system, seeing as abnormally high levels of melanin can lead to serious cases of melanoma.

7. Claims 45 and 66-67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zeng et al. in view of Vo-Dinh, further in view of Cane et al. (US Patent App. No. 2001/0056237). Zeng and Vo-Dinh jointly disclose a fluorescence detection system as discussed in the above rejection. While Zeng discloses a computer-implemented program that makes use of the peak position(s) of Raman spectra, relative intensities of different peaks to identify specific molecules and their relative concentrations relative to different tissue states in order to identify and distinguish one disease from another (column 8, lines 34-40), Zeng fails to disclose searching for melanin. Cane teaches an apparatus for monitoring the presence of one or more chromophores in a tissue sample

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via a light source, illumination, photo-receptor and spectroscopic analysis. Paragraph 177 discusses the use of this system to calculate the amounts of epidermal melanin. It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the peaks at which melanin appear into the system of Zeng in order to increase the utility of the system, seeing as abnormally high levels of melanin can lead to serious cases of melanoma.

8. Claims 71-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lewis et al., alone. Lewis discloses a spectroscopic imaging device for imaging with a spectral resolution of a few nanometers and a spatial resolution of about a micron, collected rapidly using an AOTF. The AOTF in the illustrated embodiment has a resolution of approximately 2.5 nm (column 8, lines 14-28) and can be varied based on the specific parameters of the of the AOTF, as known by one of ordinary skill in the art and described at column 1, lines 26-45. One disclosed embodiment uses parameters that allow images to be recorded over the wavelength range 400-800 nm at 2 nm increments using a 15 millisecond exposure at each wavelength. The total measurement time is 3 seconds (column 12, lines 27-44) and covers 400 nm, therefore, using these parameters it could scan 800 nm in 6 seconds. It would be obvious to one of ordinary skill in the art to modify parameters to decrease the time necessary for scanning to expedite the diagnosis of the spectral analysis. See 2144.03 [R-1], Section (A) of the MPEP where it is stated that "it might not be unreasonable to take official notice of the fact that it is desirable to make something faster, cheaper, [etc]."

9. Claims 16-17, 19-20, 25-28, 38-39, 41-42, 54-55, 57-58 and 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zeng et al., in view of Vo-Dinh, further in view of Lewis et al. See description at paragraph 11.

10. Claims 79-85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lewis et al. in view of Zeng et al., further in view of Vo-Dinh.

11. Lewis discloses a spectroscopic imaging device for imaging with a spectral resolution of a few nanometers and a spatial resolution of about a micron, collected rapidly using an AOTF. The AOTF in the illustrated embodiment has a resolution of approximately 2.5 nm (column 8, lines 14-28) and can be varied based on the specific parameters of the of the AOTF, as known by one of ordinary skill in the art and described at column 1, lines 26-45. One disclosed embodiment uses parameters that allow images to be recorded over the wavelength range 400-800 nm at 2 nm increments using a 15 millisecond exposure at each wavelength. The total measurement time is 3 seconds (column 12, lines 27-44) and covers 400 nm; therefore, using these parameters it would scan 800 nm in 6 seconds. However, Lewis does not discuss using this technique to analyze skin. Zeng in view of Vo-Dinh makes up for remaining deficiencies as described above in paragraph 4, which is incorporated herein by reference. It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the system design of Zeng into the rapid imaging and analysis technique of Lewis in order to provide a low cost and compact system (column 6, lines 35-39 of Zeng). It would have been obvious to one having ordinary skill

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in the art at the time the invention was made to incorporate the teaches of biomedical diagnostics using spectroscopy from Vo-Dinh, and also Zeng, in the high speed imaging and spectral analysis of Lewis because Lewis proposes spectral imaging as a medical diagnostic aid but does not get in to detail about its use in this field (column 1, lines 25-59).

12. With respect to claims 17, 19, 39, 41, 55 and 57, these claims represent a matter of design choice. As described in the specification of the current application, paragraph 57 states, "The bandwidth of the selected light depends on the device and the wavelength of operation, and *can be* as narrow as 1 nm FWHM." Additionally, these parameters are obvious to Lewis as described by column 1, lines 26-45.

13. With respect to claim 81, Examiner cites in re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960), where the court held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced. See MPEP 2144.04.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Kish whose telephone number is 571-272-5554. The examiner can normally be reached on 8:30 - 5:00 ~ Mon. - Fri..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JMK


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SUPERVISORY PATENT EXAMINER